What is claimed is:

1. A pattern forming method comprising the steps of:

forming a resist pattern for lift-off on a first film composed of one or more layers deposited on one surface side of a base;

patterning said first film by dry etching said first film using said resist pattern for lift-off as a mask;

depositing a second film composed of one or more layers on the one surface side of said base after said step of patterning with presence of said resist pattern for lift-off on said first film;

removing said resist pattern for lift-off to remove a portion of said second film on said resist pattern for lift-off; and

etching the one surface side of said base after said step of removing, said step of etching including dry-etching the one surface side of said base using etching particles which do not substantially form clusters, with a main incident angle of said etching particles to the one surface side of said base being set in a range of 60° to 90° relative to a normal direction of the one surface of said base.

2. A pattern forming method according to claim 1, wherein said dry etching in said step of etching is ion beam etching using a simple gas or a mixed gas composed of one

or more selected from a group consisting of He, Ne, Ar, Kr, and Xe.

3. A pattern forming method according to claim 1, wherein said resist pattern for lift-off has a shape at cross section including an undercut or an inverse tapered shape at cross section.

4. A pattern forming method according to claim 1, wherein said dry etching in said step of etching is performed while rotating said base about an axis substantially parallel with the normal.

5. A pattern forming method according to claim 1, wherein said second film includes an insulating layer.

6. A pattern forming method according to claim 1, wherein said first film includes a metal layer positioned furthest away from said base.

7. A pattern forming method comprising the steps of:

forming a resist pattern for lift-off on a first film composed of one or more layers deposited on one surface side of a base;

patterning said first film by dry etching said first film using said resist pattern for lift-off as a mask;

depositing a second film composed of one or more layers on the one surface side of said base after said step of patterning with presence of said resist pattern for lift-off on said first film;

removing said resist pattern for lift-off to remove a portion of said second film on said resist pattern for lift-off; and

etching the one surface side of said base after said step of removing, said step of etching including dry-etching the one surface side of said base with a gas cluster ion beam.

8. A pattern forming method according to claim 7, wherein said resist pattern for lift-off has a shape at cross section including an undercut or an inverse tapered shape at cross section.

9. A pattern forming method according to claim 7, wherein said dry etching in said step of etching is performed while rotating said base about an axis substantially parallel with the normal.

10. A pattern forming method according to claim 7, wherein said second film includes an insulating layer.

11. A pattern forming method according to claim 7, wherein said first film includes a metal layer positioned

furthest away from said base.

12. A method of manufacturing a magneto-resistive device having a magneto-resistive layer formed on one surface side of a base, said method comprising the steps of:

forming a resist pattern for lift-off on a first film composed of one or more layers deposited on one surface side of said base;

patterning said first film by dry etching said first film using said resist pattern for lift-off as a mask;

depositing a second film composed of one or more layers on the one surface side of said base after said step of patterning with presence of said resist pattern for lift-off on said first film;

removing said resist pattern for lift-off to remove a portion of said second film on said resist pattern for lift-off; and

etching the one surface side of said base after said step of removing, said step of etching including dry-etching the one surface side of said base using etching particles which do not substantially form clusters, with a main incident angle of said etching particles to the one surface side of said base being set in a range of 60° to 90° relative to a normal direction of the one surface of said base;

wherein said first film includes one of constituent layers making up said magneto-resistive layer, and said one

layer is positioned furthest away from said base.

13. A method of manufacturing a magneto-resistive device according to claim 12, wherein said dry etching in said step of etching is ion beam etching using a simple gas or a mixed gas composed of one or more selected from a group consisting of He, Ne, Ar, Kr, and Xe.

14. A method of manufacturing a magneto-resistive device according to claim 12, wherein said resist pattern for lift-off has a shape at cross section including an undercut or an inverse tapered shape at cross section.

15. A method of manufacturing a magneto-resistive device according to claim 12, wherein said dry etching in said step of etching is performed while rotating said base about an axis substantially parallel with the normal.

16. A method of manufacturing a magneto-resistive device according to claim 12, wherein said second film includes an insulating layer.

17. A method of manufacturing a magneto-resistive device according to claim 12, wherein said first film includes a metal layer positioned furthest away from said base.

18. A method of manufacturing a magneto-resistive device according to claim 12, wherein said first film includes a free layer, and said second film includes a magnetic domain control layer for controlling magnetic domains of said free layer.

19. A method of manufacturing a magneto-resistive device according to claim 12, wherein said magneto-resistive device includes a pair of electrodes for applying a current to an effective region of said magneto-resistive layer in a direction substantially perpendicular to a film surface thereof.

20. A method of manufacturing a magneto-resistive device according to claim 19, wherein said magneto-resistive layer includes a free layer, a tunnel barrier layer or a non-magnetic metal layer formed on one surface side of said free layer, a pinned layer formed on one surface side of said tunnel barrier layer or said non-magnetic metal layer opposite to said free layer, and a pin layer formed on one surface side of said pinned layer opposite to said tunnel barrier layer or said non-magnetic metal layer.

21. A method of manufacturing a magneto-resistive device according to claim 12, wherein:

said magneto-resistive device includes a pair of lead layers for applying a current to an effective region of said magneto-resistive layer in a direction substantially parallel with a film surface thereof, and

said pair of lead layers include an overlay which extends onto a portion of said magneto-resistive layer on one surface side of said magneto-resistive layer opposite to said base.

22. A method of manufacturing a magneto-resistive device having a magneto-resistive layer formed on one surface side of a base, said method comprising the steps of:

forming a resist pattern for lift-off on a first film composed of one or more layers deposited on one surface side of said base;

patterning said first film by dry etching said first film using said resist pattern for lift-off as a mask;

depositing a second film composed of one or more layers on the one surface side of said base after said step of patterning with presence of said resist pattern for lift-off on said first film;

removing said resist pattern for lift-off to remove a portion of said second film on said resist pattern for lift-off; and

etching the one surface side of said base after said step of removing, said step of etching including dry-etching

the one surface side of said base with a gas cluster ion beam;

wherein said first film includes one of constituent layers making up said magneto-resistive layer, and said one layer is positioned furthest away from said base.

23. A method of manufacturing a magneto-resistive device according to claim 22, wherein said resist pattern for lift-off has a shape at cross section including an undercut or an inverse tapered shape at cross section.

24. A method of manufacturing a magneto-resistive device according to claim 22, wherein said dry etching in said step of etching is performed while rotating said base about an axis substantially parallel with the normal.

25. A method of manufacturing a magneto-resistive device according to claim 22, wherein said second film includes an insulating layer.

26. A method of manufacturing a magneto-resistive device according to claim 22, wherein said first film includes a metal layer positioned furthest away from said base.

27. A method of manufacturing a magneto-resistive device according to claim 22, wherein said first film

includes a free layer, and said second film includes a magnetic domain control layer for controlling magnetic domains of said free layer.

28. A method of manufacturing a magneto-resistive device according to claim 22, wherein said magneto-resistive device includes a pair of electrodes for applying a current to an effective region of said magneto-resistive layer in a direction substantially perpendicular to a film surface thereof.

29. A method of manufacturing a magneto-resistive device according to claim 28, wherein said magneto-resistive layer includes a free layer, a tunnel barrier layer or a non-magnetic metal layer formed on one surface side of said free layer, a pinned layer formed on one surface side of said tunnel barrier layer or said non-magnetic metal layer opposite to said free layer, and a pin layer formed on one surface side of said pinned layer opposite to said tunnel barrier layer or said non-magnetic metal layer.

30. A method of manufacturing a magneto-resistive device according to claim 22, wherein:

said magneto-resistive device includes a pair of lead layers for applying a current to an effective region of said magneto-resistive layer in a direction substantially

parallel with a film surface thereof, and

said pair of lead layers include an overlay which extends onto a portion of said magneto-resistive layer on one surface side of said magneto-resistive layer opposite to said base.

31. A method of manufacturing a magnetic head including a magneto-resistive device having a magneto-resistive layer formed on one surface side of a base, said method comprising a manufacturing method according to claim 12.

32. A method of manufacturing a magnetic head according to claim 31, wherein said step of patterning defines at least an end of said magneto-resistive device on one side in a height direction thereof.

33. A method of manufacturing a magnetic head according to claim 31, wherein said step of patterning defines at least ends of said magneto-resistive device on both sides in a track width direction thereof.

34. A method of manufacturing a magnetic head including a magneto-resistive device having a magneto-

resistive layer formed on one surface side of a base, said method comprising a manufacturing method according to claim 22.

35. A method of manufacturing a magnetic head according to claim 34, wherein said step of patterning defines at least an end of said magneto-resistive device on one side in a height direction thereof.

36. A method of manufacturing a magnetic head according to claim 34, wherein said step of patterning defines at least ends of said magneto-resistive device on both sides in a track width direction thereof.

37. A head suspension assembly comprising:

a magnetic head manufactured by a manufacturing method according to claim 31; and

a suspension for supporting said magnetic head mounted near a leading end thereof.

38. A head suspension assembly comprising:

a magnetic head manufactured by a manufacturing method according to claim 34; and

a suspension for supporting said magnetic head mounted near a leading end thereof.

39. A magnetic disk apparatus comprising:

a head suspension assembly according to claim 37;

an arm for supporting said head suspension assembly; and

an actuator for moving said arm to position said magnetic head.

40. A magnetic disk apparatus comprising:

a head suspension assembly according to claim 38;

an arm for supporting said head suspension assembly; and

an actuator for moving said arm to position said magnetic head.